

## 9. Working Capital Management

### Concept of Working Capital

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*It is the capital which is used in day-to-day trading operations of a business. Working Capital is basically an indicator of the short-term financial position of an organization and is also a measure of its overall efficiency. Working Capital is obtained by subtracting the current liabilities from the current assets. This ratio indicates whether the company possesses enough assets to cover its short-term debt.*

Working capital is also known as circulating capital, fluctuating capital and revolving capital. The magnitude and composition keep on changing continuously in the course of business. Working capital to a company is like the blood to human body. It is the most vital ingredient of a business.

Current assets are those assets which will be converted into cash within the current period or within the next year as a result of the ordinary operations of the business. These are cash or near cash resources include:

- Cash and bank balance
- Receivables
- Inventory
- Raw materials, stores and spares
- Short term progress
- Finished goods
- Prepaid expenses
- Short term advances
- Temporary investments

The value represented by these assets circulates among several items. Cash is used to buy raw materials, to pay wages and to meet other manufacturing expenses. Finished goods are produced. These are held as inventories. When these are sold, account receivables are created. The collection of accounts receivable brings cash into the firm and the cycle starts again.

Current liabilities are the debts of the firms that have to be paid during the current accounting period or within a year. These include

- Creditors
- Outstanding expenses
- Short term borrowings
- Advances received against sales
- Taxes and dividends payable
- Other liabilities maturing within a year.

Working Capital indicates the liquidity levels of companies for managing day-to-day expenses and covers inventory, cash, accounts payable, accounts receivable and short-term debt that is due. Working capital is derived from several company operations such as debt and inventory management, supplier payments and collection of revenues.

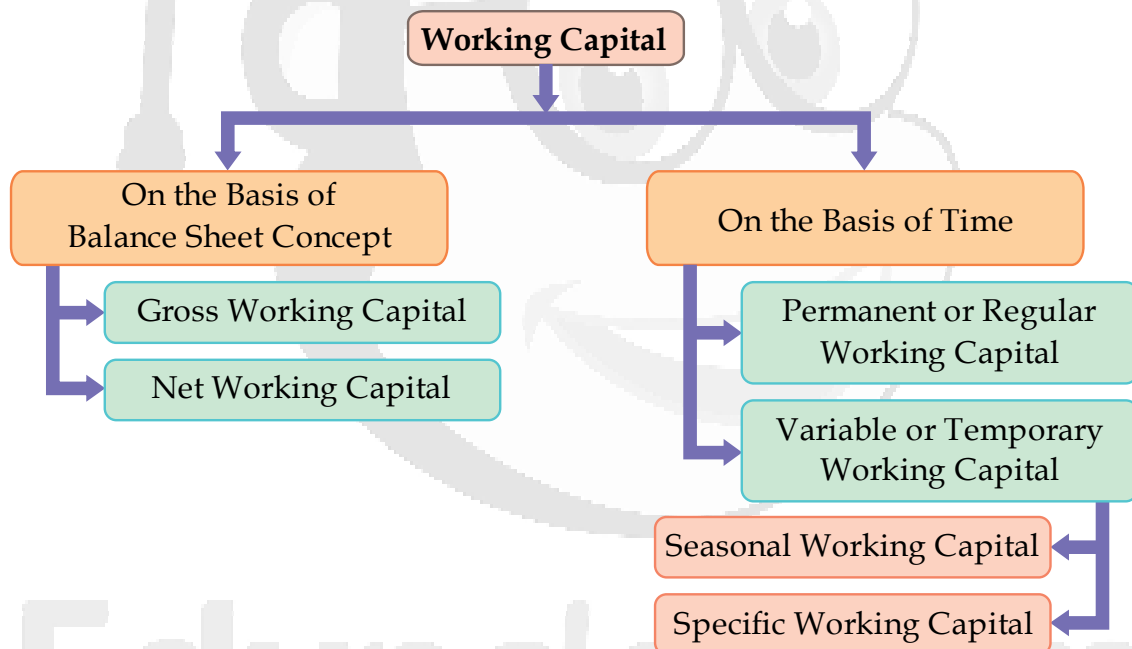
The requirement of working capital varies from firm to firm depending upon the nature of business, production policy, market conditions, seasonality of operations, supply etc. Working capital management if carried out effectively, efficiently and consistently will assure the health of an organization.

### Sources of Working Capital

The sources for working capital can either be long term, short term or even spontaneous. Spontaneous working capital are majorly derived from trade credit including notes payable and bills payable while short term working capital sources include dividend or tax provisions, cash credit, public deposits, trade deposits, short-term loans, bills discounting, inter-corporate loans and also commercial paper.

For the long-term, working capital sources include long-term loans, provision for depreciation, retained profits, debentures and share capital. These are major working capital sources for organizations based on their requirements.

### Types of Working Capital



Working Capital can be classified on two basis :

**1. Balance Sheet View Point:** According to this concept, working capital presents the current position of the firm at a certain point of time.

**(a) Gross Working Capital (Broader Sense) :**

- It refers to the sum of all the current assets in the firm.
- It is Quantitative aspect of working capital which emphasizes more on quantity than its quality.
- It is also defined as financial concept or going concern concept
- It is the broader sense of defining working capital

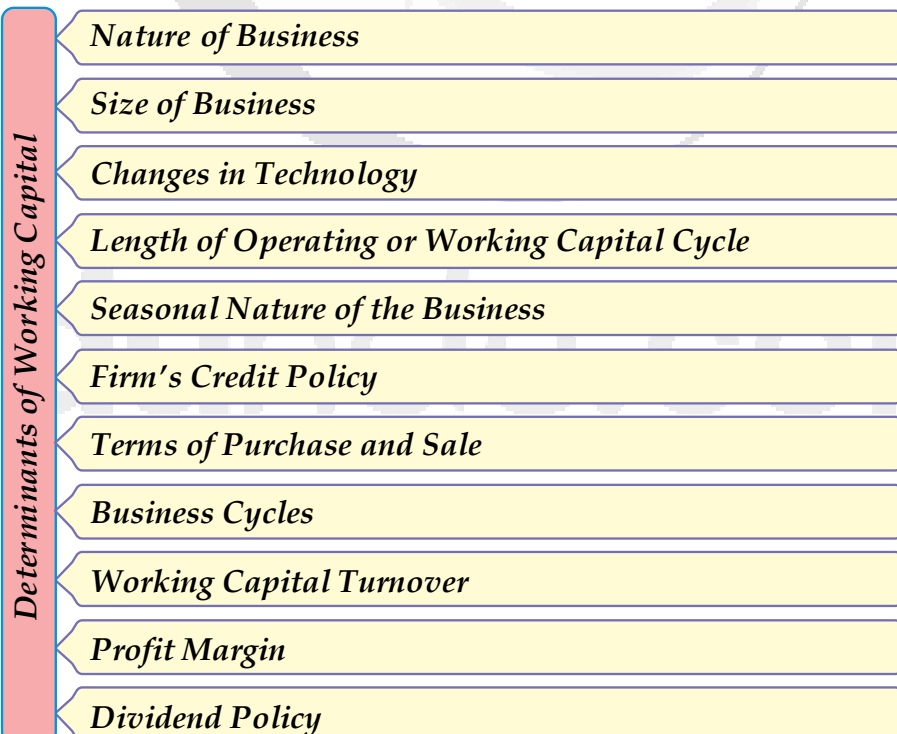
**(b) Net Working Capital (Narrower Sense) :**

- It is the excess of current assets over current liabilities.
- It can be positive or negative; When current assets exceed current liabilities, it is positive and when current liabilities are more than current assets, it is negative.
- It is a qualitative aspect of working capital and measures the liquidity.
- It is defined under narrower sense.

**2. On the Basis of Time :**

- 1. Permanent Working Capital :** It is also called fixed working capital. It means to carry on the day to day expenses the firm is required to maintain the minimum amount of working capital. For example, the firm is required to maintain the minimum level of raw material, finished goods or cash balance etc.
  - (a) Regular working capital :** It means the minimum amount which the firm has to keep with itself to carry on the day to day operation.
  - (b) Reserve working capital :** It means the excess amount over the regular working capital for uncertain circumstances like strike, lock out, depression etc.
- 2. Temporary Working Capital :** it is also called variable working capital, which is required to meet the seasonal demands as well as for special purposes.
  - (a) Seasonal working capital-** it is required to meet the seasonal needs of the enterprise.
  - (b) Specific working capital-** it is required for some special purposes of the enterprise. For example, advertising the product of the firm requires special working capital.

Temporary working capital is for short period and fluctuates while permanent working capital is stable and fixed.

**Determinants of Working Capital**

### Significance of Adequate Working Capital

The profitability of an organization depends on the quantum of working capital to a large extent. An adequate amount of working capital provides following advantages to the business enterprises:

- Prompt Payments to Suppliers and Benefit of Cash Discount
- Adequate Dividend Distribution
- Increased Goodwill and Debt Capacity
- Easy Loans from Banks
- Increased Efficiency
- Increase in Fixed Assets Productivity

### Effect of Excessive Working Capital

Excessive working capital refers to the funds which do not earn any profit for the business enterprise. A firm may suffer from following disadvantages from the excessive working capital:

- Unnecessary Stock-piling
- Defective Credit Policy
- Managerial Inefficiency
- Dissatisfaction among
- Promotes Speculation

### Working Capital Forecasting Methods

1. Percentage of Sales Method
2. Regression Analysis Method
3. Operating Cycle Method
4. Forecasting Net Current Assets Method
5. Projected Balance Sheet Method
6. Adjusted Profit and Loss Method

**1. Percentage of Sales Method :** The existing relationship between sales and working capital is identified for one or two years. If the relationship is steady over a period of time, certain percent is fixed to determine working capital over the forecasted sales. The relationship between sales and working capital and its various components may be expressed in three ways:

- as number of days of sales;
- as turnover;
- as percentage of sales.

*This method is suitable for brief period since the relationship does not vary for short period. Moreover, this method is not suitable for public limited companies and multinational corporation.*

**2. Regression Analysis Method :** Under this method, an average relationship between sales and working capital (current assets) and its various components has been established for the past years. Regression analysis can be carried out through the graphic portrayals (scatter diagrams) or through mathematical formula. There are three regression analysis methods. They are simple linear regressions, simple curvilinear regression, and multiple regression situations. The working capital can be forecasted with this regression analysis method even for the complex situations. It is particularly suitable for long term forecasting.

In the regard, the method of least square is used. The relationship between sales and working capital is expressed by the following equation :

$$Y = a + b X$$

where; X = Sales (independent variable)

Y = Working capital level (dependent variable)

a = Intercept of the least square line with vertical axis

b = Slope of the line

The value of 'a' and 'b' are obtained by using a set of two linear equations, known as normal equations in two unknowns as given below :

$$\Sigma Y = Na + b \Sigma X$$

$$\Sigma XY = a \Sigma X + b \Sigma X^2$$

The constant 'a' and 'b' can be calculated as

$$a = \frac{[\Sigma Y \Sigma X^2 - \Sigma (XY) \Sigma X]}{[N \Sigma X^2 - (\Sigma X)^2]}$$

$$b = \frac{[N \Sigma (XY) - \Sigma X \Sigma Y]}{[N \Sigma X^2 - (\Sigma X)^2]}$$

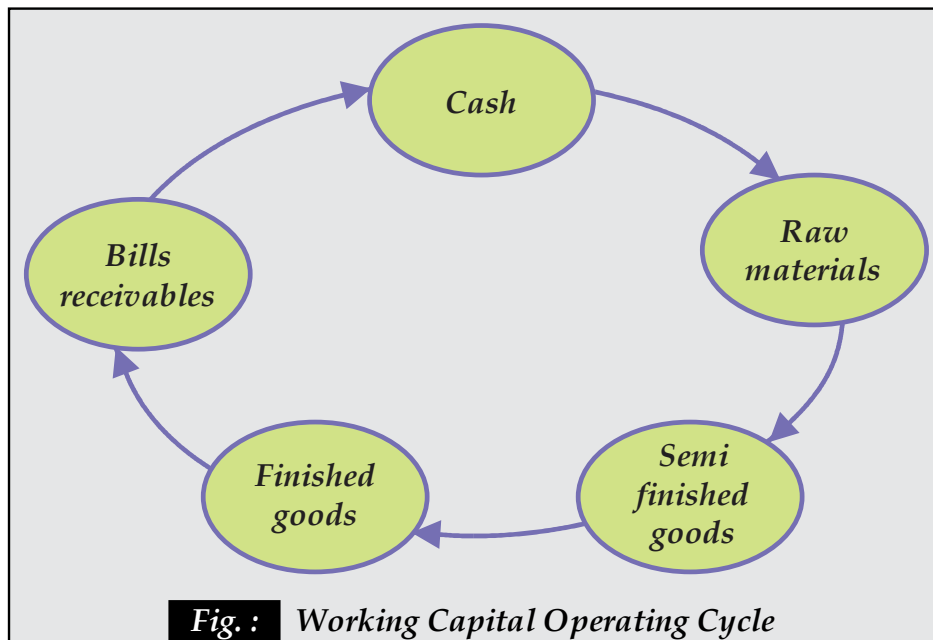
**3. Operating Cycle Method :** *The operating cycle refers to the period required to convert the cash back into cash.* In the case of trading concern, cash is used to buy goods, goods are sold on credit to customers who become sundry debtors, the sundry debtors may accept bill of exchange i.e. Bills Receivable, conversion of bills receivable into cash. At this stage, one operating cycle is completed. Thus, a loop from cash back to cash is called the "Operating Cycle".

Operating cycle of a manufacturing enterprise involves three phases :

1. Acquisition of resources such as raw material, labour, power and fuel etc.
2. Manufacture of the product which includes conversion of raw material into work-in-progress into finished goods.
3. Sale of the product either for cash or on credit. Credit sales create account receivable for collection.

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The operating cycle or circulation flow of money can best be projected in the following manner :



$$OC = M + W + F + D - C$$

where, OC = Operating Cycle Period

M = Raw Materials Storage Period

W = Work in progress or Conversion Period

F = Finished Goods Storage Period

D = Debtors Collection Period

C = Creditors Payment Period

**Material Storage Period (M)** is the period for which raw material will remain in stores before they are issued for production. It is calculated as follows :

$$= \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}} \text{ Or } \frac{\text{Average Stock of Raw Materials}}{\text{Material Consumed during the year}} \times 365 \text{ Or}$$

$$\frac{(\text{Opening Stock} + \text{Closing Stock}) / 2}{\text{Material Consumed for the year} / 365}$$

**WIP or Conversion Period (W)** is the time taken in converting the raw material into finished goods. It is calculated as follows :

$$= \frac{\text{Average Stock of Work-in-Process}}{\text{Daily Average Production Cost}} \text{ Or } \frac{\text{Average Stock of Work-in-Progress}}{\text{Total Production Cost}} \times 365$$

$$\text{Or } \frac{(\text{Opening WIP} + \text{Closing WIP}) / 2}{\text{Total Production Cost} / 365}$$

- (a) **Total production or factor cost** is calculated by adding opening stock of work-in progress in the total of direct material, labour and factory overheads and deducting from this the closing work-in-progress. Depreciation is excluded being non-cash item.

- (b) Sometimes **conversion period** is also called **Production Cycle Period**. In case, information about this period is given, then conversion period is not to be calculated by the above formula.

**Finished Goods Storage Period (F)** is the period for which goods have to remain in the warehouse before sale taken place. It is calculated as follows :

$$= \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}}$$

or

$$= \frac{\text{Average Stock of Finished Goods}}{\text{Total Cost of Goods Sold}} \times 365$$

or

$$= \frac{(\text{Opening Stock} + \text{Closing Stock}) / 2}{\text{Total Cost of Goods Sold} / 365}$$

Cost of goods sold is calculated by adding excise duty in the factory cost after adjusting opening and closing stock of finished goods. Administration and selling and distribution expenses are not considered in it as stock of finished goods is valued at production or factory cost in financial accounting.

**Debtors Collection Period (D)** is the time lag in payments by debtors or credit period allowed to debtors. It is calculated as follows :

$$= \frac{\text{Average Debtors} + B / R}{\text{Credit Sales per day}}$$

or

$$= \frac{\text{Average Receivables}}{\text{Total Credit Sales}} \times 365$$

or

$$= \frac{(\text{Opening Debtors} + \text{Closing Debtors}) / 2}{\text{Total Credit Sales} / 365}$$

**Creditors Payment Period (C)** is the length of credit period available from trade creditors or credit period allowed by suppliers. It is calculated as follows :

$$= \frac{\text{Average Creditors} + B / P}{\text{Credit Purchases per day}}$$

or

$$= \frac{\text{Average Payables}}{\text{Total Credit Purchases}} \times 365$$

or

$$= \frac{(\text{Opening Creditors} + \text{Closing Creditors}) / 2}{\text{Total Credit Purchases} / 365}$$

**Points to be considered with regard to above formulae**

- The '*Average*' value in the numerator stands for the average of opening balance and closing balance of the respective item. However, if only the closing balance is available, then even the closing balance may be taken as '*Average*'.
- The figure '365' represents number of days in a year. However, there is no hard and fast rule and sometimes even 360 days are considered.
- In the calculation of M, W, F, D and C, the denominator is calculated at cost basis and the profit margin is excluded. The reason being that there is no investment of funds in profit.
- In absence of any information, total purchase and total sales be treated a credit.

**Number of Operating Cycles :** The number of operating cycles in a period are determined by dividing the number of days in a year i.e., 365 by the length of net operating cycle. Expressed as formula :

$$\text{No. of Operating Cycle} = \frac{365}{\text{Operating Cycle Period}}$$

**Amount of Working Capital :** Once the operating expenses and the number of operating cycles have been determined, *the amount of actual working capital required is calculated by dividing the total operating expenses for the period by the number of operating cycles in that period.* For example, if the total operating expenses for the year amounts to Rs. 45,000 and the number of operating cycles in a year are assumed to be 3, the amount of working capital be Rs. 15,000 (Rs. 45,000 ÷ 3) expressed as formula :

$$\text{Working Capital} = \frac{\text{Operating Expenses}}{\text{No. of Operating Cycles}}$$

Alternatively, the working capital may be calculated by using the following formula :

$$\text{WC} = \text{C} + \frac{\text{OC}}{\text{N}} \times \text{CS}$$

Where; WC = Working Capital

C = Cash Balance Required

OC = Operating Cycle Period

CS = Estimated Cost of Goods sold

N = Number of days in year

**Provision for Contingencies :** After ascertaining the amount of working capital as above, a certain amount say 5% or 10% may be added to cover contingencies. It is to be noted that facts based on estimates may not be cent percent accurate. Therefore, this provision is made to cover the probable error in these calculations.

**Illustration :** Calculate the operating cycle and the working capital requirements from the following figures :

	Balance as on 1st April	Balance as on 31st April
	Rs.	Rs.
Raw Material	80,000	120,000
Work-in-progress	20,000	60,000
Finished Goods	60,000	20,000
Sundry Debtors	40,000	40,000
Wages and Manufacturing Expenses	—	200,000
Distribution and Other Expenses	—	40,000
Purchases of Materials	—	400,000
Total Sales	—	1,000,000

- (i) The Company obtains a credit for 60 days from its suppliers.
- (ii) All goods were sold for credit.

**Solution :**

### Computation of Operating Cycle

$$\begin{aligned}
 \text{(i) Material Storage Period} &= \frac{\text{Average Stock of Raw Materials}}{\text{Daily Average Consumption}} \\
 &= \frac{(\text{Rs. } 80,000 + 1,20,000) / 2}{\text{Rs. } 3,60,000 / 365} = \frac{\text{Rs. } 1,00,000}{\text{Rs. } 986.3} = 101.38 \text{ days.}
 \end{aligned}$$

$$\begin{aligned}
 \text{Material Consumed} &= \text{Opening Stock} + \text{Purchases} - \text{Closing Stock} \\
 &= \text{Rs. } 80,000 + 4,00,000 - 1,20,000 = \text{Rs. } 3,60,000
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) Conversion or Processing Period} &= \frac{\text{Average Stock of Work-in-progress}}{\text{Daily Average Factory Cost}} \\
 &= \frac{(\text{Rs. } 20,000 + 60,000) / 2}{\text{Rs. } 5,20,000 / 365} = \frac{\text{Rs. } 40,000}{\text{Rs. } 1,424.65} = 28.07 \text{ days}
 \end{aligned}$$

Factory Cost :	Rs.
Opening Work-in-progress	20,000
Material Consumed (as above)	3,60,000
Wages and Mfg. Expenses	<u>2,00,000</u>
	5,80,000
Less : Closing Work-in-progress	<u>60,000</u>
	<u>5,20,000</u>

$$\begin{aligned}
 \text{(iii) Finished Goods Storage Period} &= \frac{\text{Average Stock of Finished Goods}}{\text{Daily Average Cost of Goods Sold}} \\
 &= \frac{(\text{Rs. } 60,000 + 20,000) / 2}{\text{Rs. } 5,60,000 / 365} = \frac{\text{Rs. } 40,000}{\text{Rs. } 1534.25} = 26.07 \text{ days}
 \end{aligned}$$

Cost of Goods Sold :	Rs.
Opening Stock of Finished Goods	60,000
Factory Cost (as above)	<u>5,20,000</u>
	5,80,000
Less : Closing Stock of Finished Goods	<u>20,000</u>
	<u>5,60,000</u>

$$\begin{aligned}
 \text{(iv) Debtors Collection Period} &= \frac{\text{Average Debtors}}{\text{Daily Average Sales}} \\
 &= \frac{(\text{Rs. } 40,000 + 40,000) / 2}{\text{Rs. } 10,00,000 / 365} = \frac{\text{Rs. } 40,000}{\text{Rs. } 2,739.7} = 14.6 \text{ days}
 \end{aligned}$$

### Computation of Working Capital Required

$$1. \quad \text{Operating Cycle Period} = M + W + F + D - C$$

$$= 101.38 + 28.07 + 26.07 + 14.60 - 60 = 110.12 \text{ or } 110 \text{ days}$$

2. Total Cost of Sales	Rs.
Cost of Goods Sold	5,60,000
Distribution and other expenses	<u>40,000</u>
	<u>6,00,000</u>

$$3. \quad \text{Cash Working Capital} = C + \frac{OC}{N} \times CS$$

$$= 0 + \frac{110}{365} \times \text{Rs. } 6,00,000 = \text{Rs. } 1,80,822$$

**4. Forecasting Net Current Asset Method :** Under this method, the finance manager prepares a working capital forecast. *Difference between the forecasted amount of current assets and current liabilities gives net working capital requirements of the firm.* To this amount, a flat percentage would be added by way of provision for contingencies. The resulting figure will be the amount of total estimated working capital required.

As per the recommendations provided by the Tandon Committee, MPBF (Maximum Permissible Bank Finance) i.e. the maximum amount that bank can lend a borrower towards his working capital requirements. The committee suggested three different methods of computing the MPBF

**Method I MPBF = 75% of (Current Assets - Current Liabilities other than bank borrowings)**

**Method II MPBF = (75% of Current Assets) - (Current Liabilities other than bank borrowings)**

**Method III MPBF = [75% of (Current Assets - Core Current Assets)] - (Current Liabilities other than bank borrowings)**

The committee suggested gradual shift from Method I to Method III in order to make, the borrower more self-reliant in fluctuating his working capital requirements.

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Statement showing Working Capital Requirements		
	Amount	Rs.
<b>(A) Current Assets</b>		
(i) Stock of Raw Materials (for ..... Months consumption)	.....	
(ii) Work-in-process (for ..... Months)		
(a) Raw Material	.....	
(b) Direct Labour	.....	
(c) Overheads	.....	.....
(iii) Stock of Finished Goods (for ..... Month's sales)		
(a) Raw Material	.....	
(b) Labour	.....	
(c) Overheads	.....	.....
(iv) Sundry Debtors or Receivables (for ..... Month's sales)		
(a) Raw Material	.....	
(b) Labour	.....	
(c) Overheads	.....	.....
(iv) Payments in Advance (if any)		.....
(v) Balance of Cash (required to meet day-to-day expenses)		.....
(vii) Others (if any)		.....
<b>(B) Current Liabilities</b>		
(i) Creditors (for .....month's purchase of Raw Material	.....	
(ii) Lag in payment of expenses (Outstanding expenses.....month's)	.....	
(iii) Others (if any)	.....	.....
Net Working Capital (A) - (B)		.....
Add : provision for contingencies		.....
Add : provision for contingencies		.....

**Illustration :** From the following information, you are required to estimate the working capital required :

	Cost per unit (Rs.)
Raw material	200
Direct Labour	100
Overhead (excluding depreciation)	250
	-----
Total Cost	550
	-----

Estimated data for the forthcoming period are given below :

Raw Material in Stock	Average 6 Weeks
Work-in-progress (assume 50% completion stage with 100% material consumption)	Average 2 Weeks
Finished goods in stock	Average 4 Weeks

Credit allowed by suppliers	Average 4 Weeks
Credit allowed to Debtors	Average 6 Weeks
Cash at Bank expected to be	Rs. 75,000
Selling Price	Rs. 800 per unit
Output	52,000 units per annum.

Assume that production is sustained at an even pace during 52 weeks of the year. All sales are on credit basis.

**Solution :**

Computation of Net Working Capital		
(A) Current Assets	Rs.	Rs.
(i) Stock of Raw materials (6 Weeks) (Rs. 52,000 × 200 × 6/52)		1,200,000
(ii) Work-in-process (2 Weeks)		
Raw Material (Rs. 52,000 × 200 × 2/52)	400,000	
Direct Labour (Rs. 52,000 × 100 × 1/52)	100,000	
Overheads (Rs. 52,000 × 250 × 1/52)	250,000	750,000
(iii) Stock of Finished Goods (4 Weeks) (52,000 × 550 × 4/52)		2,200,000
(iv) Debtors (6 Weeks) (52,000 × 550 × 6/52)		3,300,000
(v) Cash at Bank		75,000
		7,525,000
(B) Current Liabilities		
(i) Creditors (4 Weeks) (52,000 × 200 × 4/52)		800,000
(C) Net Work Capital (A – B)		6,725,000

**Working Note :** It is assumed that there is no time-lag in payment of overheads.

## 5. Projected Balance Sheet Method

A balance sheet is prepared by adjusting the anticipated transactions for the ensuring year in the opening balances. The closing balances of all accounts are arrived other than cash and bank balances. The accountant has confirmed that all the assets and liabilities are balanced and recorded in the balance sheet. Lastly, closing cash and bank balances are arrived to find the working capital.

**Illustration :** From the following information presented by a firm for the year ended 31st March, 2007 ascertain the amount of working capital required by preparing the projected Balance Sheet :

Sales to Net Worth	5 Times
Current Liabilities to Net Worth	50%
Total Debts to Net Worth	60%
Fixed Assets to Net Worth	60%
Current Ratio	2
Sales to Stock	10 Times

Debtor's Velocity	9 Times
Annual Sales	Rs. 15,00,000
Cash Sales	40% of Sales

**Solution :**

### Balance Sheet

As on 31st March, 2007

Liabilities	Rs.	Assets	Rs.
Proprietors Fund	300,000	Fixed Assets	180,000
Long-term Debt	30,000	Current Assets :	
Current Liabilities	150,000	Stock	150,000
		Debtors	100,000
		Bank ( <i>Balancing Figure</i> )	50,000
	480,000		480,000

Working Capital = Current Assets - Current Liabilities

$$\text{Rs. 3,00,000} - \text{Rs. 1,50,000} = \text{Rs. 1,50,000}$$

Current Assets = Stock + Debtors + Bank

$$= 1,50,000 + 1,00,000 + 50,000 = \text{Rs. 3,00,000}$$

**Work Notes :**

(1) Net Work

$$\text{Sales to Net Worth} = \frac{\text{Sales}}{\text{Net Worth}}$$

$$5 = \frac{\text{Rs. 15,00,000}}{\text{Net Worth}}$$

$$\therefore \text{Net Worth} = \frac{\text{Rs. 15,00,000}}{5} = \text{Rs. 3,00,000}$$

(2) Current Liabilities

Current Liabilities to Net Worth = 50%

$$\therefore \text{Current Liabilities} = 50\% \text{ of Rs. 3,00,000} = \text{Rs. 1,50,000}$$

(3) Total Debt

Total Debt to Net Worth = 50%

$$\therefore \text{Total Debt is } 50\% \text{ of Rs. 3,00,000} = \text{Rs. 1,50,000}$$

(4) Long-term Debt

Long-term Debt = Total Debt - Current Liabilities

$$= \text{Rs. 1,50,000} - \text{Rs. 1,50,000} = \text{Rs. 30,000}$$

(5) Current Assets

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$2 = \frac{\text{Current Assets}}{\text{Rs. 1,50,000}}$$

$$\therefore \text{Current Assets} = \text{Rs. 3,00,000}$$

(6) Stock

$$\text{Stock Turnover} = \frac{\text{Sales}}{\text{Stock}}$$

$$10 = \frac{\text{Rs. 15,00,000}}{\text{Stock}}$$

$$\therefore \text{Stock} = \frac{\text{Rs. 15,00,000}}{10} = \text{Rs. 1,50,000}$$

(7) Debtors

$$\text{Credit Sales} = 60\% \text{ of Rs. 15,00,000} = \text{Rs. 9,00,000}$$

$$\text{Debtors Velocity} = \frac{\text{Credit Sales}}{\text{Debtors}}$$

$$9 = \frac{\text{Rs. 9,00,000}}{\text{Debtors}}$$

$$\therefore \text{Debtors} = \frac{\text{Rs. 9,00,000}}{9} = \text{Rs. 1,00,000}$$

(8) Fixed Assets

$$\text{Fixed Assets to Net Worth Ratio} = \frac{\text{Fixed Assets}}{\text{Net Worth}}$$

$$60\% = \frac{\text{Fixed Assets}}{\text{Rs. 3,00,000}}$$

$$\begin{aligned} \therefore \text{Fixed Assets} &= \text{Rs. 3,00,000} \times 60\% \\ &= \text{Rs. 1,80,000} \end{aligned}$$

## 6. Adjusted Profit and Loss Method

Working capital is forecasted on the basis of opening cash and bank balances. Under this method, some of the items are added and some of the items are deducted to arrive closing cash and bank balances i.e. working capital. The items like depreciation, preliminary expenses written off, deferred revenue expenses, goodwill written off, reduction in closing stock, decrease in sundry debtors and bills receivable, decrease in investments and marketable securities, increase in sundry creditors and other liabilities, increase in loans and accrued expenses are added with opening cash and bank balances.

The items like accrued rent, accrued interest/Dividend/ Royalty, increase in closing stock, increase in sundry debtors, increase in investments, increase in bills receivables, decrease in sundry creditors, bills payable and other liabilities, payment of expenses of last year and payment of dividend are deducted from opening cash and bank balances. The net amount will be required working capital.

### Cash Management

'Cash' refers to those liquid assets or liquid resources owned by a firm which enable it to purchase goods or services.

- (a) In narrow sense, cash comprises; cash on hand includes notes and coins, demand deposits, time deposits etc.
- (b) In broader sense, it includes, cash equivalents or near cash assets known as marketable securities.

**Cash is the oil that lubricates the wheels of business.** Without adequate oil, machines grind to a halt, and businesses with inadequate cash do likewise. On the other hand, carrying cash is expensive, since its non-earning asset and any cash beyond a minimum lowers a firm's potential earnings.

Cash can effectively be managed by preparing cash budget which shows the firm's projected cash inflows and outflows over some specified period of time. The efficiency of cash management can be increased through

- (i) Cash flow synchronization
- (ii) Use of float
- (iii) Prompt billing
- (iv) Expeditious collection of cheques and
- (v) Lockbox plan.

### Motives for Holding Cash

1. **Transaction Motive** : Transaction motive refers to holding of cash to meet anticipated obligations whose timings do not perfectly coincide with cash inflows.
2. **Precautionary Motive** : The precautionary motive of holding v = cash is to meet the unpredictable cash obligations of a firm.
3. **Speculative Motive** : When cash balances are maintained by a firm to take advantage of such situations.

### Dimensions of Cash Management

#### 1. Cash Planning and Forecasting

**(a) Cash Budget** : A cash budget is a summary statement presented in an orderly format containing forecasted figures of receipts and disbursements of cash over a given period of time. Cash budget like any other budget is concerned with future events, events which can be approximated or best guessed taking into considerations past results, present strengths and future trends. It is the technique of forecasting which generates raw material for budgeting and provides the best approximation.

**Cash budget is a tool of forecasting short term cash requirements of an enterprise.** They provide a blueprint of the cash inflows and outflows that are expected to occur in the immediate future period. They assist the management in determining the surplus or shortage of funds and to take suitable action.

Cash budgets are generally prepared in the following format, for short periods say month by month.

Particulars	Amounts
a. Opening Balance of Cash	
b. Cash Inflows or Receipts : Cash sales Receipts from Debtors Other Revenue Receipts Capital Receipts (to be specified)	
c. Cash Outflow or Payments : To Creditor for Goods Expenses and To Creditor for Services Other payments, which occur periodically like debenture interest, advance tax, dividend, sales tax etc. Capital Expenditures Repayment of Loans	
d. Surplus or Shortage = $b - c$ = inflows less Outflows	
e. Closing Balance of Cash = $a + b$ = Opening Balance + Surplus	

**(b) Cash Flow Statement :** A cash flow statement provides information about the changes in cash and cash equivalents of a business by classifying cash flows into operating, investing and financing activities.

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### Calculation of Cash Flows from Operating Activities

(A) Cash Flows from Operating Activities	Rs.	Rs.
Net Profit before Tax and Extraordinary Items (See Note 1)		xxx
<i>Adjustment for Non-Cash and Non-operating items</i>		
Depreciation	xxx	
Amortisation of Intangible Assets like good will, preliminary expenses, underwriting commission, discount on issue of shares and debentures etc.	xxx	
Provision for Doubtful Debts/Discount on Trade Receivables	xxx	
Foreign Exchange Gain/Loss	xxx	
Gain/Loss on Sale of Tangible Fixed Assets/Non-current Investments	xxx	xxx
Interest Paid/Received		xxx
Dividend Paid/Received		xxx
Rental Income		xxx
<i>Operating Profit before Working Capital Changes</i>		xxx
<i>Adjustment for Changes in Current Assets and Current Liabilities</i>		
Add : Decreasing Current Assets (Excluding Cash & Cash Equivalents) Trade Receivable Inventories, Prepaid Expenses	xxx	
Less : Increase in Current Assets (Excluding Cash & Cash Equivalents) Trade Receivable Inventories, Prepaid Expenses	(xxx)	
Add : Increase in Current Liabilities (Excluding Bank Overdrafts & Cash Credit) Trade Payables, O/s Expenses etc. Income Received in Advance	xxx	
Less : Decrease in Current Liabilities (Bank Overdraft & Cash Credit) Trade Payables, O/s Expenses etc. Income Received in Advance	(xxx)	
<i>Cash Generated from Operating Activities</i>		xxx
Less : Income Tax paid (Net of Refund)		(xxx)
<i>Cash before Extraordinary Items</i>		xxx
Extraordinary Items	xxx	
Loss due to Earth quake, Disaster Settlement etc.	xxx	
<i>Net Cash from (used in) Operating Activities</i>		xxx

Note No. 1 : Calculation of Net Profit before Tax	(Rs.)
Net Profit of the current year (after appropriations)	× × ×
Difference between the opening balance and closing balance of Statement of Profit & Loss	× × ×
Add : Transfer to Reserves (all transfers to Reserves from balances of Statement of Profit and Loss)	× × ×
Proposed Dividend (for current year)	× × ×
Interim Dividend (for current year)	× × ×
Provision for Tax (for current year)	× × ×
Less : Refund of Tax (credited to statement of Profit and Loss)	(× × ×)
Net Profit before Tax	× × ×

**(c) Ratio Analysis:** Ratio Analysis is a form of Financial Statement Analysis that is used to obtain a quick indication of a firm's financial performance in several key areas. Major ratios for cash planning and control are as follows :

(Focus Formulae)

- (i) 
$$\text{Cash Turnover Ratio} = \frac{\text{Sales per Period}}{\text{Initial Cash Balance}}$$
- (ii) 
$$\text{Cash Flow Coverage} = \frac{\text{Annual Cash Flow before Interest and Tax}}{\text{Interest} + \frac{\text{Principal Payment}}{(1 - \text{Tax})}}$$
- (iii) 
$$\text{Cash to-Average Daily Purchases} = \frac{\text{Cash}}{\text{Average Daily Purchases}}$$
- (v) 
$$\text{Days of Cash Available} = \frac{\text{Average Cash Balance}}{\text{Average Daily Outflows}}$$

## 2. Managing the Cash Flows

**Cash flow management is the process of tracking how much money is coming into and going out.** Cash flow management refers to the process by which an organization maintains control over the inflow and outflow of funds. *The fundamental goal of cash flow management is to ensure that the incoming flow of funds is always greater than the outgoing so that the business sits on a surplus.* Cash flows includes both cash inflows and cash outflows.

**(a) Managing Cash Inflows:** It refers to collection of cash required a detailed study of each phase of the cash cycle. The aim of managing collection of cash is to reduce these time lags as far as possible. Efforts to reduce time-lags aims at speeding up cash collections. Methods used for accelerating cash inflows:

- (1) Timely Billing and Cash Discount:
- (2) Reducing Time Gap in Deposit Float

**(b) Managing Cash Outflows:** It refers to the management of cash outflows is to slow down or delay the payments as much as possible. Its aim is to ensure that payments and obligations are discharged timely, delayed payments would tarnish the reputation of the company and affect the credit worthiness. So, reduction in outflows is effective remedy for the company. Measures used for reduction in cash outflows are:

- (1) Centralised Disbursement Centre
- (2) Payments on Due Dates
- (3) Synchronisation between receipts and payments
- (4) Playing the Float

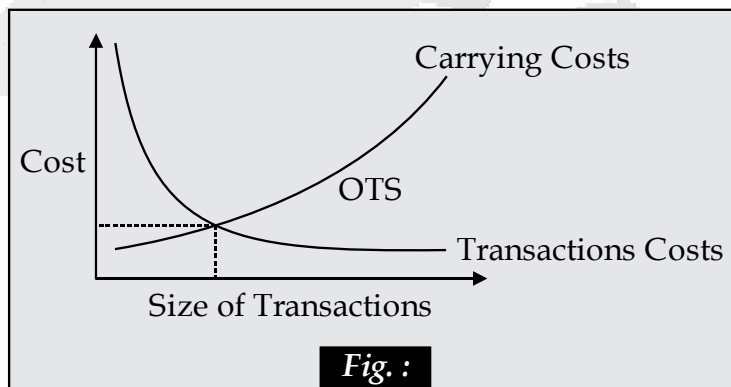
### Cash Management Models

**(i) Baumol or Economic Order Quantity (EOQ) Model:** *This model was suggested by William j. Baumol in 1952.* According to this model, optimum level of cash is where the carrying costs and transactions are minimum.

**Carrying Costs:** This refers to the cost of holding cash, namely the interest foregone on marketable securities. They may also be termed as opportunity cost of keeping cash balance.

**Transaction Costs:** This refers to the cost involved in getting the marketable securities converted into cash. This happens when the firm falls short of cash and must sell securities resulting in clerical, brokerage, registration and other costs.

There is an inverse relationship between the two costs. When one increases, the other decreases. Hence, diagrammatically EOQ (optimal transfer size) can be represented as:



The formula for obtaining optimum transfer size of cash can be put as follows

$$C = \sqrt{\frac{2 \times A \times F}{R}}$$

where C = Optimum cash level

A = Annual or monthly cash disbursements

F = Fixed costs per transaction

R = Interest rate per month or annum on marketable securities

**Illustration :** The monthly cash requirements of a company are Rs. 60,000; fixed cost per transaction Rs. 10 and interest rate on marketable securities is 6% p.a. Find the optimum cash balance.

**Solution :** Given; A = Rs. 60,000; F = 10; R = 6% p.a. or 0.5% per month = .005

$$C = \sqrt{\frac{2AF}{R}} = \sqrt{\frac{2 \times 10 \times 60,000}{.005}} = \text{Rs. } 15,492 \text{ or Rs. } 15,500$$

Thus, optimum cash balance to be held is Rs. 15,500 and average cash balance is Rs. 7,750 (Rs. 15,500/2)

The firm can make (Rs. 60,000/15,500) transactions of marketable securities during the month.

## Assumption

Inventory model of cash management is based on the following assumptions :

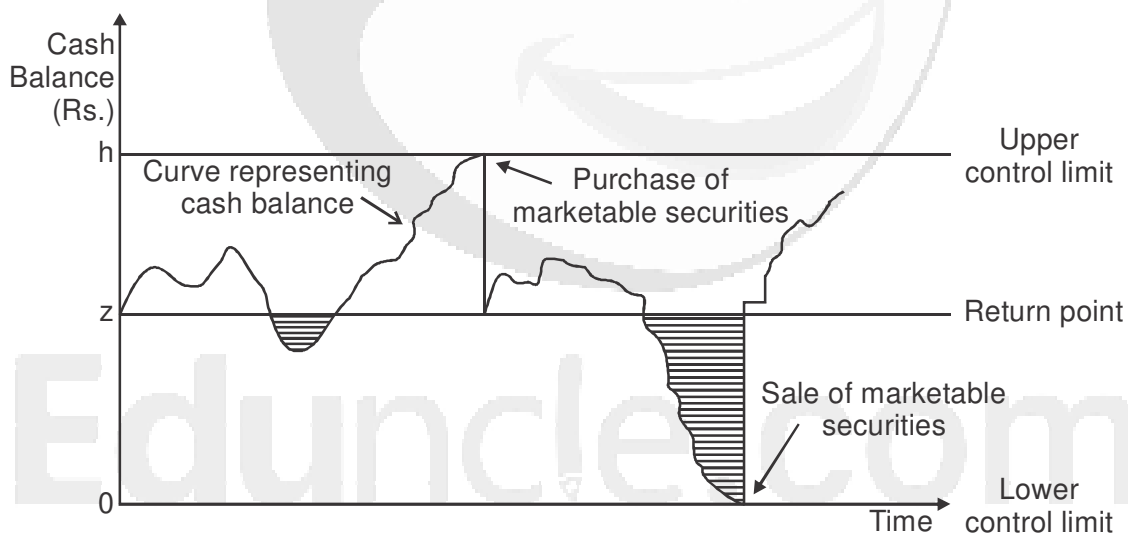
- The demand for cash, transaction costs for obtaining cash and the holding period costs for a particular period are given and do not change during that period.
- There is a constant demand for cash during the period under consideration.
- Cash payments are predictable.
- Bankers do not impose any restrictions on firms in respect of maintenance of minimum amount of balance in the bank account.

## Limitations of the optimum cash model:

- Cash payments are assumed to be steady over the period specified. When the cash payment becomes uneven, it may be appropriate to reduce the period for which calculations are made so that expenditures during the period are relatively steady.
- Cash payments are seldom predictable. Hence the model may not give 100 % correct results.

## 3. Stochastic or Miller-Orr Model

*Baumol's model is based on the basic assumption that the size and timing of cash flows are known with certainty.* This usually does not happen in practice. The cash flows of a firm are neither uniform nor certain. *Miller-Orr model helps in determining the optimum level of cash in such circumstances.* It deals with cash management problem under the assumption of stochastic or random cash flows by laying down control limits for cash balance. These limits consist of an upper limit (h), lower limit (o) and return point. No transaction between cash to marketable securities and marketable securities to cash is made during this period when the cash balance stays between the high and low limits.



**Fig. : Miller-or Cash Management Model**

The return point for the cash balance under the Miller-Orr model can be calculated as follows:

$$\text{Return Point} = \text{Lower Limit} + \frac{\text{Spread}}{3}$$

The lower limit is set by management. It can be set as zero if a business has sufficient investments in marketable securities or perfect creditworthiness and can raise additional short term debt at any time.

$$\text{Spread} = 3 \times \sqrt[3]{\frac{3 \times F \times \sigma^2}{4 \times k}}$$

where, F = transaction cost,

k = opportunity cost of holding cash, and

$\sigma^2$  = Variance of a daily cash balance.

Upper Limit = Lower Limit + Spread

$$Z = 3 \left( \frac{3}{4} \times \frac{\text{Transaction Cost} \times (\text{Variance of Cash Flows})^2}{\text{Interest Rate}} \right)^{\frac{1}{3}}$$

and, Upper limit of cash balance is,  $\text{Upper Limit} = \text{Lower Limit} + \text{Spread}$

**Illustration :** The management of Stilmill Inc. has set a safety cash balance of \$50,000. The standard deviation ( $\sigma$ ) of the daily cash balance during the last year was \$37,500, and the transaction cost was \$75. The company also has the opportunity to invest idle cash in marketable securities at an annual interest rate of 8%.

$$\text{Daily interest rate} = \frac{8\%}{365} = 0.022\%$$

$$\text{Spread} = 3 \times \sqrt[3]{\frac{3 \times \$75 \times \$37,500^2}{4 \times 0.00022}} = \$213,325$$

$$\text{Return point} = \$50,000 + \frac{1}{3} \times \$213,325 = \$121,108$$

$$\text{Upper limit} = \$50,000 + \$213,325 = \$263,325$$

#### Assumptions :

1. The cash inflows and cash outflows are stochastic. In other words, each day a business may have both different cash payments and different cash receipts.
2. The daily cash balance is normally distributed, i.e., it occurs randomly.
3. There is a possibility to invest idle cash in marketable securities.
4. There is a transaction fee when marketable securities are bought or sold.
5. A business maintains the minimum acceptable cash balance, which is called the lower limit.

**Ques.** Permanent working capital is generally financed through (NTA UGC-NET June 2013 P-II)

- |                             |                                 |
|-----------------------------|---------------------------------|
| (A) Long term Capital Funds | (B) Government Assistance       |
| (C) Internal Financing      | (D) Short term loans from Banks |

**Ans.** (A) Long term Capital Funds

**Ques.** Which one of the following expressions has incorrect matching ?

(NTA UGC-NET Sept. 2013 P-III)

- (A) A method of financing where each asset would be offset with a financing instrument of the same approximate maturity : Hedging Approach.
- (B) A method of financing where all long term funds are used to finance the current assets Aggressive Approach.
- (C) The amount of current assets required to meet a firm's long term minimum needs : Permanent working capital.
- (D) Trade credit and other payables that arise in the firm's day to day operations : Spontaneous Financing.

**Ans.** (B) A method of financing where all long term funds are used to finance the current assets Aggressive Approach.

**Ques.** From the following indicate the correct combination of the cash management models :

- (i) Modigliani-Miller (M-M) model
- (ii) Miller-Orr (MO) model
- (iii) Ezra Solomon Model
- (iv) Baumol Model

**Codes :**

(NTA UGC-NET Aug. 2016 P-III)

- (A) (i), (ii), (iii)
- (B) (ii), (iii), (iv)
- (C) (i), (iii)
- (D) (ii), (iv)

**Ans.** (D) (ii), (iv)

**Ques.** Insufficient working capital in any enterprise may also result into

(NTA UGC-NET Dec. 2014 P-III)

- (i) Failure to adapt to changes
- (ii) Over capitalization
- (iii) Reduced availability of trade and cash discounts
- (iv) Reduced volume of production and sales
- (A) (i), (ii) and (iii) only
- (B) (i), (iii) and (iv) only
- (C) (ii) and (iii) only
- (D) (i) and (iv) only

**Ans.** (B) (i), (iii) and (iv) only